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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of Harunori Hirao et al.	
Serial No. 09/919,024	
Filed: July 31, 2001	Group Art Unit: 1625 Examiner: Taylor V. OH
For: Method for Starting Up Reactor	

Commissioner for Patents
Washington, D.C. 20231

SIR:

REQUEST FOR RECONSIDERATION

This response is submitted pursuant to the Final Office Action dated April 9, 2003, to which a response is due July 9, 2003. Claims 1-4 are under consideration.

CLAIM REJECTION UNDER 35 U.S.C. §112

Claims 1, 2 and 4 stand rejected under 35 U.S.C. §112, first paragraph. The Office Action asserts that "the specification, while being enabling for propane, propylene, acrolein, isobutylene, mathacrolein as a raw material, does not reasonably provide enablement for all the raw material in the chemical field." The Office Action also asserts that "the specification, while being enabling for a shell and tube reactor, as a reactor, does not reasonably provide enablement for all the reactors in the chemical field."

As previously argued, Applicants respectfully point out that claims 1, 2 and 4 include a recitation of "a raw material to be oxidized" in a catalytic gas phase oxidation reaction, not any "raw material" in the chemical field. Applicants contend that the specification not only provides working examples of "raw materials to be oxidized," such as propane, propylene, acrolein, isobutylene, mathacrolein, but also provides guidance and direction on how to determine whether a particular compound is "a raw material to be oxidized." For example, Figure 4 describes the oxidation profile of "raw materials to be oxidized" in the presence of oxygen, including lower explosion oxygen limit for "raw materials to be oxidized." One of ordinary skill in the art would expect that "raw materials to be oxidized" would have oxidation profiles similar to that of Figure 4. Moreover, based on the disclosure of the present application, one of ordinary skill in the art would also be able to determine what does "a raw material to be oxidized" in the claimed process include. In addition, one of ordinary skill in the art would reasonably correlate the oxidation profiles of propane and propylene with those of all other "raw materials to be oxidized." Furthermore, as shown in col. 1, lines 25-35 of Takada et al, there are many raw materials for the catalytic gas phase oxidation reaction which is further evidence that those skilled in the art would understand what raw materials can be used in the present invention based on the oxidation profiles of such raw materials. Therefore, the present specification provides enabling disclosure to the recitation of "a raw material to be oxidized" in claims 1, 2 and 4 because "as long as the specification discloses at least one method for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claim, then the enablement requirement of 35 U.S.C. §112 is satisfied." See M.P.E.P. 2164.01(b) and *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970).

With regard to the Examiner's objection to the use of the term "reactor" in claims 1, 2 and 4, Applicants respectfully point out that the present application claims "a reactor for the reaction of catalytic gas phase oxidation," not "all reactors in the chemical field" (emphasis added). Applicants contend that the present specification provides enabling disclosure to the recitation of "a reactor for the reaction of catalytic gas phase oxidation" in claims 1, 2 and 4. Specifically, the specification provides working examples of

"reactors for the reaction of catalytic gas phase oxidation" such as shell and tube reactors. It also provides guidance and direction as to what type of reactors can be used "for the reaction of catalytic gas phase oxidation." Therefore, the present specification provides enabling disclosure to the recitation of "a reactor for the reaction of catalytic gas phase oxidation" in claims 1, 2 and 4 under the standard of M.P.E.P. 2164.01(b).

In addition to the above, under MPEP 2164.03, the amount of guidance or direction needed to enable the invention is inversely related to the amount of knowledge in the state of the art as well as the predictability in the art. *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970). The "amount of guidance or direction" refers to that information in the application, as originally filed, that teaches exactly how to make or use the invention. The more that is known in the prior art about the nature of the invention, how to make, and how to use the invention, and the more predictable the art is, the less information needs to be explicitly stated in the specification. The "predictability or lack thereof" in the art refers to the ability of one skilled in the art to extrapolate the disclosed or known results to the claimed invention. If one skilled in the art can readily anticipate the effect of a change within the subject matter to which the claimed invention pertains, then there is predictability in the art.

Further, in order to make a rejection, the examiner has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. *In re Wright,* 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993). A specification disclosure which contains a teaching of the manner and process of making and using an invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as being in compliance with the enablement requirement of 35 U.S.C. 112, first paragraph, unless there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support. *In re Marzocchi*, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971). As stated by the court "it is incumbent upon the Patent Office, whenever a rejection on this basis is made, to explain why it doubts the truth or accuracy of any statement in a supporting disclosure and to back up assertions of its own with

acceptable evidence or reasoning which is inconsistent with the contested statements." 439 F2d at 224, 169 USPQ at 370.

Furthermore, the evidence provided by applicant need not be conclusive but merely convincing to one skilled in the art. *In re Brandstadter*, 484 F.2d 1395, 1406-07, 179 USPQ 286, 294 (CCPA 1973).

The Examiner has not provided any evidence as to why those skilled in the art would not understand, based on the oxidation profiles of raw materials and teachings from prior art, such as Takada et al, how to use the present invention. Also, because the knowledge and use of oxidative states of raw materials is high, Applicants do not need to include a laundry list of raw materials in the present invention nor limit the scope to those particular raw materials listed in the present invention.

Based on the foregoing, Applicants respectfully request that the rejection under 35 U.S.C. 112, first paragraph, with respect to claims 1, 2 and 4 be withdrawn.

CLAIM REJECTION UNDER 35 U.S.C. 112

Claims 1, 2 and 4 stand rejected under 35 U.S.C. §112, second paragraph as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Office Action objects to the use of the phrases "a raw material," "the concentration of raw material is less than the concentration of the lower explosion limit of said raw material" and "the concentration of oxygen is not less than the limiting concentration."

As stated in Applicants' previous response to the enablement rejection, claims 1, 2 and 4 recite "a raw material to be oxidized," not any "raw material."

Applicants would like to direct the Examiner's attention to M.P.E.P. 2173.05(b) which states that "the meaning of a term used in the claim should be apparent from the prior art or from the specification" and "accessibility of the claimed language depends on

whether one of ordinary skill in the art would understand what is claimed, in light of the specification."

In this case, the meaning of the phrases "a raw material to be oxidized," "the concentration of raw material is less than the concentration of the lower explosion limit of said raw material" and "the concentration of oxygen is not less than the limiting concentration" are clear to one of ordinary skill in the art in light of the specification. Specifically, one of ordinary skill in the art would understand the term "a raw material to be oxidized" as defining those "raw materials" that can be oxidized and show an oxidation profile similar to that of Figure 4. Moreover, as defined on page 11, lines 4-7 of the present specification, the phrase "the concentration of raw material is less than the concentration of the lower explosion limit of said raw material" means "the lowest possible concentration of the raw material in the composition of the gas forming the explosion range in the oxidation profiles similar to those of Figures 1 and 4." The phrase "the concentration of oxygen is not less than the limiting concentration" is defined as "the lowest possible concentration of oxygen in the composition of the gas forming the explosion range." Furthermore, each raw material to be oxidized has its characteristic values of "lower explosion limit" and "the limiting concentration of oxygen" and one of ordinary skill in the art would clearly understand what is claimed in claims 1, 2 and 4 by using these phrases.

In addition to the above, the same statutory argument incorporating MPEP 2164.03, 2164.04 and 2164.05 applied toward the 35 U.S.C. §112, first paragraph rejection above is applicable here.

Based on the foregoing, Applicants respectfully request that the 35 U.S.C. §112, second paragraph rejection with respect to claims 1, 2 and 4 be withdrawn.

CLAIM REJECTION UNDER 35 U.S.C. §102(b)

Claims 1-4 stand rejected under 35 U.S.C. §102(b) as being anticipated by Takada et al., U.S. Patent No. 4,203,906 ("Takada").

Applicants respectfully disagree with this ground of rejection. A rejection under 35 U.S.C. §102(b) is only proper when directed toward an invention that is *identically* disclosed or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States. Applicants would like to point out that the claimed invention is not *identically* disclosed or described according to 35 U.S.C. §102(b). The claimed invention is directed to a method of starting up a reactor for catalytic gas phase oxidation reaction and Takada does not disclose any such method. Takada discloses a catalytic vapor phase oxidation process using a fixed bed shell and tube heat exchange type of reactor.

In contrast to the invention defined by the present claims, Takada does not disclose any steps of (i) a method for starting up the reactor and (ii) causing said raw material and said molecular oxygen-containing gas to pass a range in which the concentration of said raw material (excluding the concentration of said raw material at 0 vol. %) is less than the concentration of the lower explosion limit of said raw material and the concentration of oxygen is not less than the limiting oxygen concentration.

Applicants describe, in Fig. 4 and page 4, lines 1-18 of the specification, conventional ways of controlling the concentrations of oxygen, a raw material and steam as to avoid undesired combustion reactions. Since the reactor is filled with air prior to its' starting, conventionally it is necessary to supply expensive diluting gases such as nitrogen gas and carbon dioxide gas in large amounts and to control the concentration of oxygen with high-grade technology. See page 4, line 19 to page 5, line 5 in the specification.

The examiner also states that in example 5 of the Takada reference, a reaction gas composition of 7.0% by volume of propylene, 12.6% by volume of oxygen, 10% by volume of steam and balance of inert gas containing nitrogen gas is supplied to the catalyst stage (col. 10, lines 17-21). However, the issue of the present invention is whether or not (i) a raw material and a molecular oxygen-containing gas are controlled in order to pass a range in which the concentration of the raw material is less than the

concentration of the lower explosion limit of the raw material and the concentration of the lower explosion limit of the raw material and the concentration of oxygen is not less than the limiting oxygen concentration (ii) during starting up the reactor. Namely, as mentioned in Fig, 1 of the specification, the methods of the present invention are identified by passing points of ② → ③ → ④ → ① to avoid the combustion. In contrast, Takada only shows the result of the concentrations of the reaction gas composition in a steady state. Furthermore, Takada does not teach the process of controlling the concentrations of the reaction gas compositions during starting up the reactor.

Therefore, Takada does not disclose how to control the concentrations of a raw material and a molecular oxygen containing gas in the above mentioned range according to the present invention.

Next, the Examiner concludes, based on the Takada gas composition of 7.0% by volume of propylene, 12.6% by volume of oxygen, 10% by volume of steam and the balance of inert gas containing nitrogen gas being supplied to the catalyst stage, that Takada implies the importance of the explosion limit of both raw materials and oxygen and therefore Takada definitely teaches the process of controlling conditions of the raw material and the molecular oxygen-containing gas in the start-up of the reactor.

Applicants traverse because, as mentioned above, there are numerous methods for avoiding combustion. The methods described in Applicant's specification, under *Background of the Invention*, are all invariably uneconomical because they require large amounts of expensive diluting gases. Also, they are unfavorable because they require a large supply of thermal energy for the generation of the steam and efforts to save the diluting gas is likewise a disadvantage that inevitably increases the reaction time. See page 6, lines 2-9 in the specification.

Takada only relates to a process for catalytic vapor phase oxidation which comprises using a fixed-bed shell and tube heat exchanger type reactor divided into two

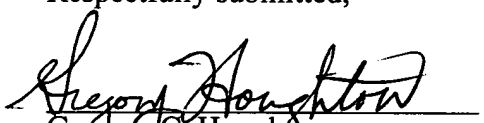
zones, supplying feed gas to the tubes and conducting exothermic catalytic vapor phase oxidation while controlling the temperatures for heat transfer medium in each of the zones so that the temperature difference between each of the zones can be maintained between 0-100° C.

Further to the reasons cited above, "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the... claim." *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Based on the foregoing, Takada does not *identically* disclose or describe the present invention. Accordingly, Applicants respectfully request that the rejection of claims 1-4 under 35 U.S.C. §102(b) as being anticipated by Takada et al., U.S. Patent No. 4,203,906 ("Takada") be withdrawn.

The application is now believed to be in a condition for allowance and an early notification thereof is respectfully requested. The Examiner is invited to contact the undersigned should she believe this would expedite prosecution of this application. It is believed no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,



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